

2003 Summary

Hospitals and laboratories in Washington participate in a voluntary network of sentinel reporters to provide information on trends of anti-microbial resistance. This report summarizes resistance trends through year 2003 for three pathogens of public health importance: *Streptococcus pneumoniae* (pneumococcus), vancomycin resistant enterococcus (VRE), and methicillin-resistant *Staphylococcus aureus* (MRSA).

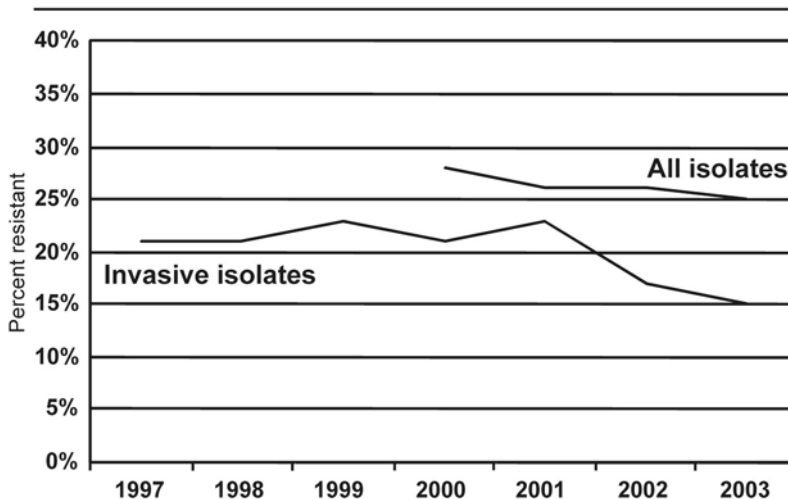
For the state as a whole, the proportion of *Streptococcus pneumoniae* with reduced susceptibility to penicillin has been declining. The proportion of enterococcus isolates resistant to vancomycin is remaining stable at levels lower than the national average. Prevalence of methicillin (oxacillin) resistant *Staphylococcus aureus* continues to increase in both inpatient and outpatient populations.

For the year 2003, antibiograms (cumulative anti-microbial susceptibility test data) were collected from laboratories that provide microbiology services to 36 hospitals and 24 outpatient populations throughout the state. Each of five Washington regions was represented by at least four reporting sites (range 4 –11 sites). See appendix tables on page 5 for numbers of isolates reported by region for years 2000-2003.

Streptococcus pneumoniae

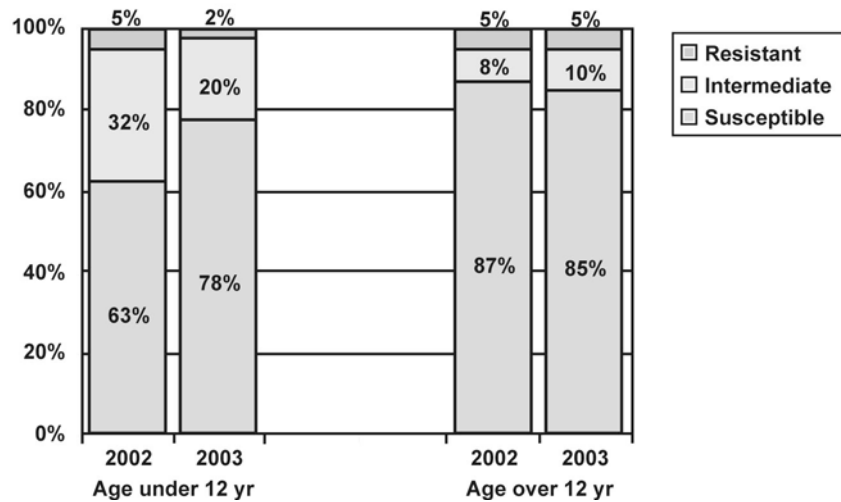
Twenty-two hospitals and laboratories reported cases of invasive pneumococcal disease in 2003. At 15%, the proportion of *S. pneumoniae* blood or spinal fluid isolates (n = 354) with reduced susceptibility to penicillin was the lowest since sentinel tracking was established in 1997. Reduced susceptibility included 11% intermediate and 4% fully resistant to penicillin. Antibiograms typically include isolates from all body sources, including the respiratory tract. From these data, the prevalence of reduced susceptibility to penicillin was 25%.

**Washington Penicillin Resistance Trend
for *Streptococcus pneumoniae***

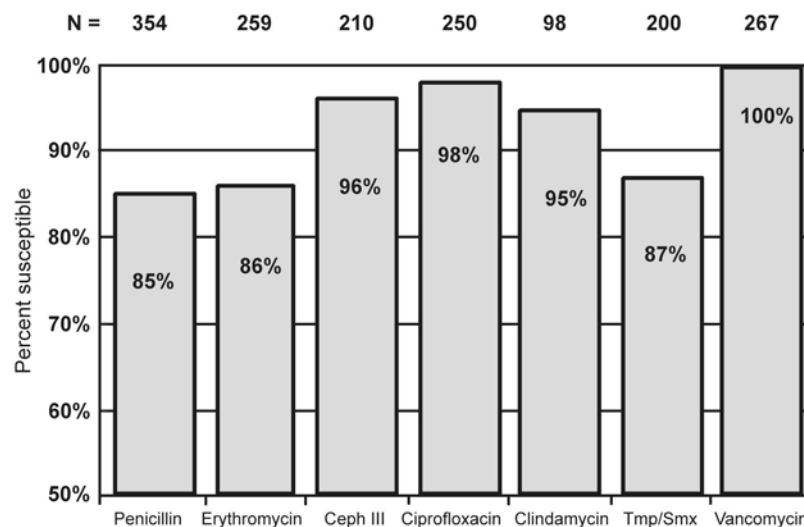


The percentage of invasive pneumococcal isolates with intermediate susceptibility to penicillin remains higher in children than in adults, although the difference is less in 2003 than previous years.

Invasive *S. Pneumoniae* Penicillin Susceptibilities 2003 Children versus Adults

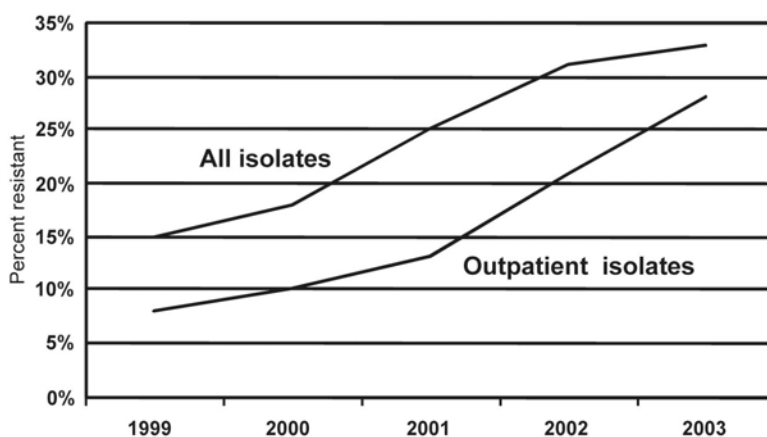


Invasive *S. Pneumoniae* Susceptibilities 2003 Various antimicrobials



Staphylococcus aureus

Statewide prevalence of MRSA as a proportion of *S. aureus* reached 33% in 2003, with a rate of 47% for isolates from hospitalized patients. Median prevalence for individual hospitals reached 50% (range 36 – 60%). Striking increases were also seen in the proportion of MRSA from outpatient isolates, almost tripling over the past three years from 10% to 28%. The range for individual laboratories reporting outpatient isolates in year 2003 was 22% - 47%.

Washington Five Year MRSA Trend

Healthcare systems in Washington are also reporting increases in the proportion of MRSA cases that are community-acquired (CA) as distinguished from healthcare-associated (HA). Genetic fingerprinting of surveillance isolates from community sources was done in 2003 at the WA State Public Health Laboratories (PHL) using pulsed-field gel electrophoresis. A predominant MRSA clone associated with community-acquired cases of MRSA was identified which is widely dispersed geographically in Washington. Person-to-person spread in the community is probably the major factor influencing prevalence of this strain. The extent to which other community staphylococcal strains of diverse genetic background may also be acquiring resistance, or the extent to which healthcare-associated strains may also be spreading into the community is currently unknown.

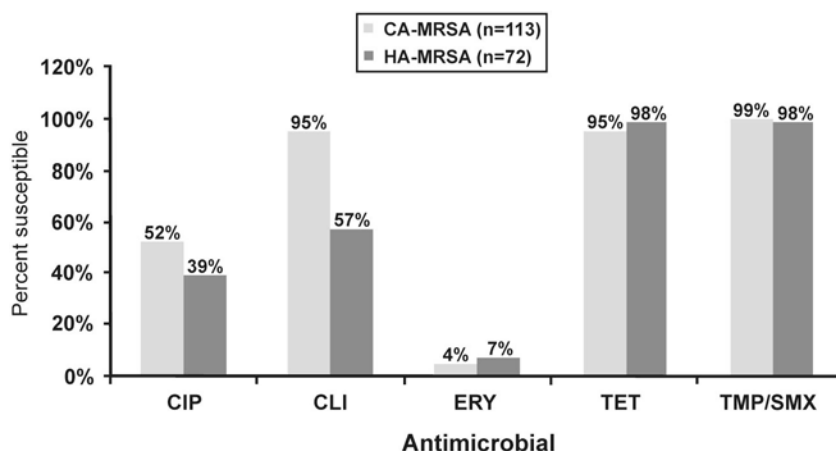
This identified strain falls within a clonal group described by the Centers for Disease Control and Prevention as USA300*, which is genetically distinct from healthcare-related MRSA strains, and is associated primarily with community-acquired skin infections. In Washington, isolates of this strain follow a similar pattern, with 91% coming from skin or soft tissue specimen sources. While MRSA historically has been associated with older age groups, the median age for patients from whom this strain has been isolated is 23.5 years. Four deaths associated with the predominant community MRSA strain were reported to DOH in 2003.

* McDougal LK, Steward CD, Killgore GE. Pulsed-Field Gel Electrophoresis Typing of Oxacillin-Resistant *Staphylococcus aureus* Isolates from the United States: Establishing a National Database. *J Clin Microbiol* 2003; 41(11):5113-20.

The increasing prevalence of MRSA among outpatients and of community-acquired MRSA affects primary care clinicians in several important ways: Clinicians should heighten their level of suspicion for MRSA when staphylococcal infection is suspected, they should be aware of the reduced efficacy for cephalosporins (and all beta-lactam antibiotics) as empiric therapy for suspected staph skin infection, and they may need to consider more frequent culture and sensitivity testing to guide treatment choices. For extensive guidance to clinicians for evaluation and management of CA-MRSA skin and soft tissue infections in outpatient settings see http://www.doh.wa.gov/Topics/Antibiotics/providers_MRSA.htm.

Most MRSA isolates submitted to the PHL in 2003 were resistant to erythromycin, in addition to all beta-lactam antibiotics. Nearly all were sensitive to tetracycline and trimethoprim/sulfamethoxazole. Community strain isolates differed from hospital isolates mainly in susceptibility to clindamycin (95% vs. 57%) and to ciprofloxacin (52% vs. 39%). Inducible clindamycin resistance was not detected when “D” testing was done on a sample of CA-MRSA erythromycin R, clindamycin S isolates.

Susceptibility of CA and HA-MRSA Isolates by Antimicrobial Agent, WA PHL, 2003



Resources:

For information on Staphylococcal clindamycin resistance, Disk Induction testing and reporting see http://www.phppo.cdc.gov/nltn/pdf/2004/2_Hindler_D-Test.pdf.

For information on antibiotic resistance, patient education fact sheets and links to additional resources see <http://www.doh.wa.gov/Topics/antibiotics.htm>.

Appendix

Table 1

Invasive *Streptococcus pneumoniae* penicillin susceptibility

Non-duplicated blood and spinal Fluid Isolates from sentinel reporters 1997-2003

	Isolates	Non-susceptible		Intermediate		Fully Resistant	
Year	Total Number	Number	%	Number	%	Number	%
1997	166	34	20.5	16	9.6	18	10.9
1998	278	58	20.9	27	9.7	31	11.2
1999	190	43	22.6	35	18.4	8	4.2
2000	90	19	21.1	13	14.4	6	6.7
2001	69	16	23.2	9	13.0	7	10.2
2002	231	39	16.9	28	12.1	11	4.8
2003	354	55	15.1	40	11.0	15	4.1

Table 2

***S. pneumoniae* penicillin susceptibility (all body sources)**

Aggregate Washington Antibigrams reporting two levels of resistance 2000 – 2003

	Isolates	Non-susceptible	Intermediate		Fully resistant	
Year	Total N	%	N	%	N	%
2000	816	31	137	17	117	14
2001	1395	25	211	15	140	10
2002	842	30	168	20	81	10
2003	664	23	109	16	43	7

Table 3

***S. pneumoniae* penicillin susceptibility (all body sources)**

Aggregate Washington Antibigrams all isolates 2000 – 2003

Year	Isolates Tested	% Non-susceptible	% Susceptible
2000	1361	28	72
2001	2125	26	74
2002	1903	26	74
2003	1904	25	75

Table 4

***Staphylococcus aureus* resistant to oxacillin (MRSA)**

Aggregate Washington Antibigrams 2000 – 2003

	All Isolates Tested		Hospital patients		Outpatients	
Year	N	%	N	%	N	%
2000	24546	18	4522	19	5479	10
2001	30895	25	6126	25	5601	13
2002	30465	31	4758	42	7034	21
2003	28076	33	5493	47	9907	28

Table 5
MRSA prevalence by Washington region
Aggregate Washington Antibigrams 2000 - 2003

	East		Central		Northwest		King		Southwest	
Year	N	%	N	%	N	%	N	%	N	%
2000	1883	21	3387	16	2884	28	8520	13	7872	20
2001	1834	25	3480	17	3879	27	13156	23	8546	31
2002	2122	26	1749	29	3566	36	14522	29	8491	33
2003	3340	31	3576	29	4549	36	10979	30	5632	41

Table 6
Enterococcus isolates resistant to vancomycin (VRE)
Aggregate Washington Antibigrams 2000 - 2003

	All isolates		Hospital patients		Outpatients	
Year	N	%	N	%	N	%
2000	7834	4.8	1822	5.2	315	1.0
2001	10392	5.5	2466	9.7	382	0.5
2002	16819	5.3	3003	11.8	3032	1.1
2003	12992	4.1	3226	10.0	2443	1.1

Table 7
VRE prevalence by Washington region
Aggregate Washington Antibigrams 2000 - 2003

	East		Central		Northwest		King		Southwest	
Year	N	%	N	%	N	%	N	%	N	%
2000	713	2.0	1824	1.1	501	4.0	3326	7.9	1470	4.0
2001	289	1.9	1986	1.9	914	2.0	5627	7.9	1576	4.0
2002	1366	2.9	1425	2.9	1576	3.6	8616	7.7	3836	2.4
2003	2014	2.4	1914	2.5	1775	3.3	4334	7.0	2955	2.6

Table 8
VRE Prevalence by Species
Aggregate Washington Antibigrams 2000 – 2003

	All enterococcus		E. faecalis		E. faecium	
Year	N	%	N	%	N	%
2000	7834	4.8	1606	0.8	324	70.5
2001	10392	5.5	2539	1.4	530	68.6
2002	16819	5.3	4257	0.9	668	69.2
2003	12992	4.1	2908	0.7	437	63.9